

Use of CytoSorb in a patient with necrotizing fasciitis and septic shock

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This case reports on a 73-year-old male patient (known pre-existing conditions: arterial hypertension) who was hospitalized with fatigue, dyspnea and severe pain in his left shoulder.

Case presentation :

- His SAPS III score on admission was 94
- Thoracic CT showed bilateral effusions, a poorly ventilated area on the left as well as streaky appearance of fatty tissue in the area of the shoulder matching the clinical picture of an inflammatory process
- Due to progressive deterioration of his general condition, the patient was then transferred to the intensive care unit (ICU)
- Initiation of antibiotic therapy with cefotaxime and clindamycin
- At this juncture, the patient already was oliguric
- Magnetic resonance tomography (MRT) of the shoulder was performed to exclude osteomyelitis. During this examination, the patient rapidly decompensated, requiring emergency intubation. The MRT showed no evidence of osteomyelitis, however confirmed an infection of the soft tissues as well as pneumatic infiltrate in the left lower lobe
- Transfer of the patient intubated and ventilated back to the ICU followed initiation of continuous renal replacement therapy (CRRT) due to anuria
- At this time, the patient was also already highly dependent on catecholamines. Within only 7 hours, the norepinephrine requirement had increased from 0.01 µg/kg/min to 0.5 µg/kg/min and vasopressin administration (0.013 IU/min) had to be started for hemodynamic stabilization
- This was paralleled by the requirement of massive amounts of fluids with a fluid balance of plus 7 liters in the first 7 hours
- Significantly elevated inflammatory parameters (leukocytes 36,000/µl, CRP 371 mg/l, PCT 75.4 ng/ml) indicated a generalized hyperinflammatory reaction
- In addition, laboratory diagnostics showed deranged coagulation (aPTT 87 sec, INR 2.2, fibrinogen 200 mg/dl), hyperlactataemia (12 mmol/l) and a significant increase in retention parameters (creatinine 2.88 mg/dl) with a reduced GFR (21 ml/min)
- Installation of advanced hemodynamic PiCCO monitoring for volume and catecholamine management
- Meanwhile the patient had several episodes of hypoglycemia requiring glucose administration
- Despite multiple smears and blood cultures, no positive pathogen could be detected. The antibiotic regime was changed to meropenem, fosfomycin with continuation of clindamycin
- Due to the clinical picture of septic shock with multiple organ failure, progressing hemodynamic instability, hyperinflammation, and capillary leak syndrome, CytoSorb hemoadsorption was started 2 hours after initiation of continuous renal replacement therapy

Treatment

- Two consecutive treatments with CytoSorb for 18 hours (1st treatment for 6 hours, 2nd treatment for 12 hours)
- CytoSorb was used in combination with CRRT (Prismaflex, Gambro) run in CVHDF mode
- Blood flow rate: 150 ml/min
- Anticoagulation: Citrate
- CytoSorb adsorber position: post-hemofilter

Measurements

- Hemodynamic situation
- Inflammatory parameters
- Fluid balance
- Coagulation
- Lactate

Results

- Rapid improvement in hemodynamics - after 18 hours, vasopressin could be clearly reduced while norepinephrine dose could be halved (0.25 µg/kg/min). 48 hours later, norepinephrine could be gradually reduced to 0.02 µg/kg/min, whereas vasopressin had been weaned off at this time
- Directly after completion of CytoSorb treatment, lactate plasma concentrations were within the normal range and remained at this level thereafter
- Good control of the hyperinflammatory situation under CytoSorb. Two days after the end of therapy, CRP and PCT levels were 188 mg/l and 20 ng/ml, respectively. Leukocytes slowly decreased over the following days to 24,000/µl while the initial thrombocytopenia recovered and slowly returned to normal values after one week together with a normalization of the coagulatory system.
- 48 hours after completion of CytoSorb therapy, his fluid balance was stable without further massive fluid requirements. Subsequently, fluid withdrawal was commenced by means of dialysis and after 6 days, neutral fluid balance was achieved

Patient Follow-Up

- Following CytoSorb therapy, a necrosectomy was performed followed by VAC therapy for a total of 5 days
- Discontinuation of renal replacement therapy with the onset of spontaneous diuresis after a total of 12 days with concomitant recovery of renal function
- Termination of mechanical ventilation after 23 days following difficult weaning necessitating tracheostomy
- Clear improvement of the perfusion disturbances of the acros
- Transfer to the normal ward after a total of 36 days on intensive care
- At the time of documentation, the patient is clinically stable and without neurological deficits, however he remains on the normal ward for further monitoring

Conclusions

- In the present case of a patient with necrotizing fasciitis and septic shock, the combined treatment with continuous renal replacement therapy and CytoSorb hemoadsorption resulted in rapid stabilization of hemodynamics along with normalization of the inflammatory situation, improvement in lactic acidosis, restoration of renal function as well as regression in the capillary leak syndrome
- According to the medical team, the patient could be adequately stabilized by the use of CytoSorb, particularly during the acute phase. The possibility to rapidly reduce high catecholamine doses paralleled by a reduction of substantial microcirculatory disturbances, has clearly contributed to the treatment success of this critically ill patient
- Application of CytoSorb was safe and easy